IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF: :
MINEYUKI KUBOTA, ET AL. : EXAMINER: BROOKS, C.
SERIAL NO.: 10/583,554 :
FILED: JUNE 19, 2006 : GROUP ART UNIT: 1621
FOR: LIGHT-EMITTING MATERIAL FOR ORGANIC ELECTROLUMINESCENT DEVICE, ORGANIC ELECTROLUMINESCENT DEVICE USING SAME, AND MATERIAL FOR ORGANIC ELECTROLUMINESCENT DEVICE

DECLARATION UNDER 37 C.F.R. § 1.132

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

I, Masakazu FUNAHASHI, of c/o 1280, Kamiizumi, Sodegaura-shi, Chiba, Japan, declare that:

1. I graduated from Tokyo Institute of Technology with a master's degree in March, 1993 and have been employed by Idemitsu Kosan Co., Ltd. since April, 1993, where I have engaged in research and development of electroluminescence devices and materials at Central Research Laboratory since June, 1993.

2. I am one of the inventors of the above-identified U.S. Patent Application and familiar with the subject matter disclosed therein.

3. I have reviewed Office Action mailed March 18, 2011 and noted that claims 1-6 and 12-14 are rejected under 35 U.S.C. 103(a) over JP-11323323 alone or in view of US 2003/0068524 and that claims 1-5 and 13-14 are rejected under 35 U.S.C. 103(a) over EP 1009044.

4. I have conducted the following experiment to show the effect of the different substituents at 9- and 10-position of the anthracene ring.

EXPERIMENT

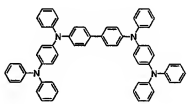
Production of Device

A 25 mm × 75 mm × 0.7 mm glass substrate (manufactured by Asahi Glass Company Ltd.) having an ITO (In-Sn-O) transparent electrode was ultrasonically cleaned in isopropyl alcohol for 5 min. After blowing nitrogen gas, the glass substrate having the transparent electrode was ultraviolet-cleaned for 30 min under atmospheric pressure. The cleaned glass substrate having the transparent electrode line was mounted on a substrate holder of a vacuum deposition apparatus.

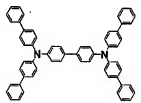
A TPD232 film of 60 nm thick was formed in vacuum on the surface of the transparent electrode. This film works as a hole injecting layer. Then, a TBDB film of 20 nm thick was formed on the TPD232 film. This film works as a hole transporting layer.

On the TBDB film, the compound AN40 and the compound D1 (40:3 by weight) were co-deposited to form a film of 40 nm thick. This film works as a light emitting layer.

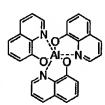
On the light emitting layer, Alq was deposited to form a film of 20 nm. This film works as electron injecting layer. Then, a lithium fluoride film of 1 nm thick was formed, on which metallic Al was vapor-deposited to form a metal electrode of 80 nm thick, to obtain an organic electroluminescence device.



TPD232



TBDB

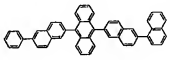
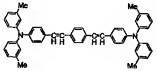
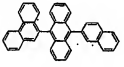
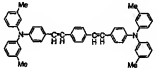
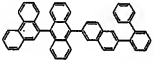
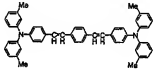
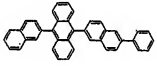
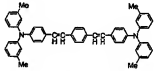
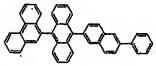
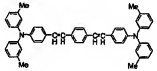
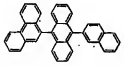
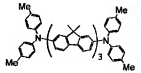
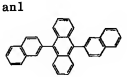
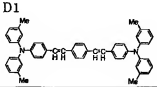


Alq

Evaluation of Device Performance

The current efficiency (cd/A) of the organic electroluminescence device driven at a current density of 10 mA/cm^2 was measured. Further, the organic electroluminescence device was driven at a constant current and at an initial luminance of 1,000 cd/m^2, and the time (half lifetime) taken until the luminance was reduced to half (500 cd/m^2) was measured. The results are

shown in the following table together with the results of Examples 3-4 and 6-8 and Comparative Example 1.

	Light-Emitting Layer		Current Efficiency (cd/A)	Half Lifetime (h)
	host	dopant		
Experiment				
	AN40 	D1 	10.7	7,500
Examples				
3	AN11 	D1 	11.0	5,800
4	AN13 	D1 	10.8	3,700
6	AN6 	D1 	10.1	3,300
7	AN12 	D1 	10.8	4,900
8	AN11 	D2 	10.3	3,700
Comparative Example				
1	an1 	D1 	9.0	2,200

5. I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 2011. Dec. 9

Masakazu Funahashi

Masakazu FUNAHASHI